REMARKS

Claims 1, 2, 5-6, 8, 13-19, and 21-23 are pending in the application. Claim 1 is amended to include features of dependent claims 4, 7, and 10, which are cancelled, and features from the original specification as filed, including lines 8-18 on page 4. Claims 3 and 9 were previously cancelled. Claims 11, 12 and 20 remain withdrawn. Claims 21-23 are new; support is found in the original specification as filed, including lines 8-18 on page 4 and originally filed claims 10 and 15.

The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

1. Obvious-Type Double Patenting

The Examiner states that a provisional ODP (presumably obviousness-type double patenting) rejection is maintained and that a terminal disclaimer is forthcoming by the Applicant.

Applicants submit that no such ODP rejection is present in this or any other Office Action related to the present application. Applicants believe this is an erroneous statement by the Examiner. Therefore, no arguments are presented to this ODP rejection.

2. Rejection Under 35 U.S.C. § 103 – Soane

Claims 1, 2, 4-8, 10 and 13-19 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Soane et al (U.S. Pat. No. US 2003/0013369, herein "Soane").

Independent claim 1 is drawn to a textile treatment agent having at least a first textile-treating fraction and at least one other fraction. Specification page 2, lines 5-10. The first textile treating fraction includes nanoparticles having a size range of from about 5

nm to about 100 nm that are inorganically surface modified by aluminum chloride, aluminum oxide chloride, titanium, titanium oxide sulfate, zirconium oxide, zirconium oxide chloride, and combinations thereof and designed to form an inorganic structure on the textile. Specification page 2, lines 11-21 and page 3, lines 23-36.

The present claims are not obvious in view of Soane as the reference fails to provide all the claimed features, as required by *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (reference must teach or suggest all the claim limitations to establish a *prima facie* case of obviousness). In particular, Soane is silent with respect to nanoparticles that are inorganically surface modified by aluminum chloride, aluminum oxide chloride, titanium, titanium oxide sulfate, zirconium oxide, zirconium oxide chloride, and combinations thereof and designed to form an inorganic structure on the textile. Moreover, there is no apparent reason for a person of ordinary skill to include the missing subject based upon the Soane disclosure. See *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1740-41, 82 USPQ2d 1385, 1396 (2007) (obviousness includes determining whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue). There is also no way for a skilled artisan to "optimize" the organic polymeric encapsulator of Soane to be an inorganic surface modification.

Soane discloses nanoparticle-based treatment of textiles. Soane abstract. The nanoparticles use monomers, oligomers, or polymers that are polymerized around a payload to form a polymeric encapsulator. Soane paragraph [0014]. Where the particle is a sunblock agent, the agent may be coated with silane coupling agents or may be encapsulated with polymers to provide an organic layer surrounding the particulate. Soane paragraph [0123]. However, the silane coupling agents having the general

formulas disclosed in Soane paragraph [0124] are organosilanes. Such organosilanes include the commercially available examples of 3-(triethoxysilyl)propylsuccinic anhydride (possibly employing a catalyst that is capable of reforming any opened anhydride groups) and N-(3-triethoxysilylpropyl)gluconamide (using a compound that contains two or more N-methylol groups). Soane paragraph [0127]. Thus, Soane is using "silane" to refer generally to organosilanes, as evidenced by both the general structures and species provided. See also definition of "silane" in IUPAC Compendium of Chemical Terminology, 2nd ed. (the "Gold Book"); compiled by A. D. McNaught and A. Wilkinson; Blackwell Scientific Publications, Oxford (1997); XML on-line corrected version: http://goldbook.iupac.org (2006-) created by M. Nic, J. Jirat, B. Kosata; updates compiled by A. Jenkins. ISBN 0-9678550-9-8; available at http://goldbook.iupac.org/S05663.html (Where it is noted that hydrocarbyl derivatives, such as the general formulas in Soane, and other derivatives are often referred to loosely as silanes.); a hardcopy is enclosed with the present amendment.

As a result, the Soane reference fails to provide nanoparticles that are inorganically surface modified, much less modified by aluminum chloride, aluminum oxide chloride, titanium, titanium oxide sulfate, zirconium oxide, zirconium oxide chloride, and combinations thereof. The Soane reference is also focused on providing polymeric encapsulation (i.e., reaction of organic functional groups, even in the case of silanes) of the payload material and fails to provide any basis or reason to employ inorganic surface modifications. Finally, there is no way for a skilled artisan to optimize the Soane compositions to include the presently claimed features, as switching from organic to inorganic surface modifications is a fundamental shift in approach that is unsupported by the Soane disclosure, any suggestion therein, or the general knowledge in the art. Hence

the Soane reference is inadequate to form a case of obviousness.

Reconsideration of the claims and withdrawal of the rejection are requested.

3. Rejection Under 35 U.S.C. § 103 – Zuechner

Claims 1, 2, 4-8 and 16-19 stand rejected under 35 U.S.C. § 103(a) as allegedly obvious over Zuechner et al (WO 01/83662 / English equivalent US Pub. US 2004/0023824, herein "Zuechner").

A prima facie case of obviousness cannot be established using Zuechner as the reference lacks all of the claimed features. As illustrated in the preceding section, claim 1 includes nanoparticles are inorganically surface modified by aluminum chloride, aluminum oxide chloride, titanium, titanium oxide sulfate, zirconium oxide, zirconium oxide chloride, and combinations thereof. In contrast, the Zuechner reference only discloses particles for modifying textiles where the particles are coated with organic complexing agents. Zuechner paragraphs [0002], [0011], and [0016]. For example, complexing agents include phosphonates (e.g., 1-hydroxyethane-1,1-diphosphonic acid), heavy metal complexing agents (e.g., ethylenediamine tetracetic acid), and hydroxycarboxylic acids (e.g., citric acid). Zuechner paragraphs [0017]-[0019]. The Zuechner reference therefore cannot establish a *prima facie* case of obviousness as it fails to provide all of the claimed features. Moreover, there is no suggestion based either on the reference or the general knowledge in the art as to how or why a skilled artisan would modify the Zuchner teachings to replace the organic complexing agents with oxides, hydroxides, salts, and combinations thereof to provide inorganic surface modifications, including the particular species of compounds, as presently claimed. Such changes cannot be accomplished via optimization. Consequently, the claims are patentable over Zuechner.

Reconsideration of the claims and withdrawal of the rejection are requested.

4. Rejection Under 35 U.S.C. §§ 102(e) & 103(a) – Rohrbaugh

Claims 1, 2, 4-8 and 13-18 stand rejected under 35 U.S.C. § 102(e) as allegedly anticipated by or, in the alternative, under 35 USC 103(a) as allegedly obvious over Rohrbaugh et al (US 2001/0151634, herein "Rohrbaugh").

In contrast to claim 1, Rohrbaugh does not provide nanoparticles that are inorganically surface modified by aluminum chloride, aluminum oxide chloride, titanium, titanium oxide sulfate, zirconium oxide, zirconium oxide chloride, and combinations thereof. Instead, the Rohrbaugh reference only discloses coating compositions using nanoparticles (e.g., LAPONITE™) and organic nanoparticles (e.g., nanolatex) that are surface modified using Ca^{+2}, Mg^{+2}, Ba^{+2}, Al^{+3}, Fe^{+2}, Fe^{+3}, and Cu^{+2}. Rohrbaugh paragraphs [0044]-[0069].

Rohrbaugh indicates that the nanoparticles may have their surface functionalized. Rohrbaugh paragraphs [0066]. Functionalized surface molecules can be selected from multi-valent inorganic salts consisting of Al^{+3}, among other listed cations, where an appropriate anion is used to balance the charge. Rohrbaugh paragraph [0069]. Notably, however, the reference is silent regarding the specific species of anion or the species of aluminum chloride or aluminum oxide chloride for that matter, and notably the reference makes no mention whatsoever of cationic or anionic species relating to titanium, titanium oxide sulfate, zirconium oxide, and zirconium oxide chloride. The present claims are therefore patentable over Rohrbaugh as the reference lacks all of the claimed subject matter. See *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (each and every

element in the claim must be present in the reference for the claim to be anticipated); and see *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (combined references must teach or suggest all the claim limitations to establish a *prima facie* case of obviousness).

What is more, there is no suggestion or reason provided for a skilled artisan to use the presently claimed species of aluminum chloride or aluminum oxide chloride. A substantial number of aluminum salts are known to the skilled artisan, including both inorganic and organic salts, and the Rohrbaugh reference provides no guidance in choosing amongst the vast array of these potential anions. In addition, only titanium, titanium oxide sulfate, zirconium oxide, and zirconium oxide chloride are disclosed in the present application and claims. There is no basis for modifying Rohrbaugh to include any of these compounds. Accordingly, the present claims are not obvious over the reference as the rejection fails to provide an apparent reason by which a skilled artisan would modify the reference teachings to include the missing subject matter.

Reconsideration of the claims and withdrawal of the rejection are requested.

5. Rejection Under 35 U.S.C. § 103 – Soane & Hamers

Claims 7-8 stand rejected under 35 USC 103(a) as allegedly unpatentable over Soane et al., as applied to the claims above, and further in view of Hamers et al. (US 2004/0025262, herein "Hamers").

Soane and Hamers cannot establish a case of obviousness as the combination fails to provide an apparent reason to select, modify, and combine their respective features to provide nanoparticles that are inorganically surface modified by a member of the group consisting of aluminum chloride, aluminum oxide chloride, titanium, titanium oxide sulfate,

zirconium oxide, zirconium oxide chloride, and combinations thereof and designed to form an inorganic structure on the textile. See *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1734, 82 USPQ2d 1385, 1391 (2007) (An obviousness inquiry includes determining "whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.").

Soane is provided as illustrated above for disclosing nanoparticle-based treatment of textiles. Soane abstract. The Soane nanoparticles have monomers, oligomers, or polymers that are polymerized around a payload to form a polymeric encapsulator. Soane paragraph [0014]. These nanoparticles may be coated with silane coupling agents; however, the disclosed silane coupling agents are organosilanes that provide an organic coating. Soane paragraph [0124]; see also examples including 3-(triethoxysilyl)propylsuccinic anhydride in paragraph [0127]. Thus, Soane does not provide inorganically surface modified nanoparticles.

Hamers provides reactive modified particulate polymers formed, for example, by reacting various monomers such as ethyleneically unsaturated monomers. Hamers paragraphs [0013]-[0107]. These particles of reactive modified polymers crosslink to treated textiles by heating or drying. Thus, operability of the reference teachings requires this reactivity. The reactive modified particulate polymers (i.e., organic particles) may also be cationically modified by treatment with polyvalent metal ions, where aluminum chloride is listed. Hamers paragraph [0108].

Thus, on one hand Soane provides inorganic nanoparticles encapsulated with organic polymer, and on the other hand Hamers provides reactive modified (organic) particles that may be surface modified with aluminum chloride. Notably, however, there is no suggestion or guidance provided as how one of ordinary skill in the art may

combine the collective teachings or what benefit may be obtained by doing so. Such reasoning is a requisite for a case of obviousness. See *In re Kahn*, 441 F3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.") (quoted with approval in *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007)). For example, there is no basis provided for particularly modifying (cationically) the Soane nanoparticles by treatment with polyvalent metal ions such as aluminum chloride, which is used in Hamers to modify reactive modified (organic) particles.

The present rejection simply suggests that modifications of the prior art would have been within the ordinary skill of the art because the references teach that aspects of the claimed invention were individually known in the art. However, no objective reason is supplied as to what particular benefits a skilled artisan may hope to achieve in making the combination. Moreover, the inorganic nanoparticles encapsulated with organic polymer (as per Soane) and the reactive modified particulate polymers (as per Hamers) operate in different manners; i.e., the reactive modified particulate polymers are dried to crosslink with the fabric. Consequently, it is not clear why a skilled artisan would combine features from Hamers with Soane.

Reconsideration of the claims and withdrawal of the rejection are requested.

6. Conclusion

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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